

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference <b>P04005</b>	<b>FOR FURTHER ACTION</b>	See item 4 below
International application No. <b>PCT/JP2004/012180</b>	International filing date ( <i>day/month/year</i> ) <b>25 August 2004 (25.08.2004)</b>	Priority date ( <i>day/month/year</i> ) <b>25 August 2003 (25.08.2003)</b>
International Patent Classification (8th edition unless older edition indicated) <b>See relevant information in Form PCT/ISA/237</b>		
Applicant <b>ULVAC, INC.</b>		

1.	This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).																								
2.	This REPORT consists of a total of 8 sheets, including this cover sheet.  In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.																								
3.	<p>This report contains indications relating to the following items:</p> <table style="width: 100%;"> <tr> <td style="width: 10%; text-align: center;"><input checked="" type="checkbox"/></td> <td style="width: 30%;">Box No. I</td> <td style="width: 60%;">Basis of the report</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>	<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input checked="" type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input checked="" type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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<input type="checkbox"/>	Box No. VIII	Certain observations on the international application																							
4.	The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).																								

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. +41 22 740 14 35	Date of issuance of this report <b>08 May 2006 (08.05.2006)</b>  Authorized officer  <b>Masashi Honda</b>  Telephone No. +41 22 338 70 10
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# PATENT COOPERATION TREATY

TRANSLATION

From the  
INTERNATIONAL SEARCHING AUTHORITY

## PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing (day/month/year)	<b>See Form PCT/ISA/210 (sheet 2)</b>
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Applicant's or agent's file reference <b>P04005</b>		<b>FOR FURTHER ACTION</b> See paragraph 2 below	
International application No. <b>PCT/JP2004/012180</b>	International filing date (day/month/year) <b>25.08.2004</b>	Priority date (day/month/year) <b>25.08.2003</b>	
International Patent Classification (IPC) or both national classification and IPC <b>7 H01L21/316 C23C16/40</b>			
Applicant <b>ULVAC, INC.</b>			

1. This opinion contains indications relating to the following items:

<input checked="" type="checkbox"/>	Box No. I	Basis of the opinion
<input type="checkbox"/>	Box No. II	Priority
<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input checked="" type="checkbox"/>	Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input checked="" type="checkbox"/>	Box No. VI	Certain documents cited
<input type="checkbox"/>	Box No. VII	Certain defects in the international application
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/JP	Authorized officer
Facsimile No.	Telephone No.

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

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Box No. I

Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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Box No. IV

Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has:
- ☒ paid additional fees
  - ☐ paid additional fees under protest
  - ☐ not paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is
- ☐ complied with
  - ☒ not complied with for the following reasons:
- The special technical feature of claims 1 and 4 to 10 is a feature wherein "the oxidizing gas flow rate ratio is at least 60% based on the mixed gas."
- The special technical feature of claims 2 and 3 and claim 11 is a feature wherein "first, an initial layer is formed as a seed layer using said mixed gas, and then a second layer is continuously formed using a mixed gas having a higher proportion of oxidizing gas than during formation of said initial layer."
- The special technical feature of claims 12 to 14 is a feature wherein "gas activation means are interposed between a mixer and a shower plate."
4. Consequently, this opinion has been established in respect of the following parts of the international application:
- ☒ all parts
  - ☐ the parts relating to claims Nos. \_\_\_\_\_

**WRITTEN OPINION OF THE  
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**Box No. V** Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

**1. Statement**

Novelty (N)	Claims	2-6, 11-14	YES
	Claims	1, 7-10	NO
Inventive step (IS)	Claims	2-3	YES
	Claims	1, 4-14	NO
Industrial applicability (IA)	Claims	1-14	YES
	Claims		NO

**2. Citations and explanations:**

Document 1: JP 8-268797 A (Hitachi, Ltd.), 15 October 1996

Document 2: JP 2003-86586 A (Murata Mfg. Co., Ltd.), 20 March 2003

Document 3: JP 8-83793 A (Hyundai Electronics Industries Co., Ltd.), 26 March 1996

Document 4: JP 2000-58525 A (NEC Corp.), 25 February 2000

Document 5: JP 11-126877 A (Ramtron International Corp.), 11 May 1999

Claims 1 and 7 to 10

The invention set forth in claims 1 and 7 to 10 lacks novelty in the light of document 1 cited in the international search report. The feature wherein "the proportion of oxidizing gas is at least 60% of the mixed gas," described in the present claim 1, is disclosed in document 1 (paragraph [0032]).

Claims 1 and 7 to 10

The invention set forth in claims 1 and 7 to 10 does not involve an inventive step in the light of document 2 cited in the international search report. Document 2 does

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International application No.

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Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

not disclose a "shower plate." However, a shower plate is a known shape for a nozzle on a chemical vapor deposition apparatus for manufacturing an oxide thin film. Therefore, a person skilled in the art could easily conceive of employing said constitution.

Claims 4 to 6 and 12 to 14

The inventions set forth in claims 4 to 6 and 12 to 14 do not involve an inventive step in the light of document 1 and document 3 cited in the international search report. The chemical vapor reaction lamination apparatus having a nozzle with a shower shape (102), disclosed in document 1, and the CVD apparatus having a mixing chamber (5) and wherein all gas induction lines up to a process tube (7) are heated, disclosed in document 3, belong to closely related technical fields. Therefore, a person skilled in the art could easily conceive of applying the configuration having a mixing vessel and wherein all piping up to a chemical vapor deposition apparatus is heated, disclosed in document 3, to the chemical vapor deposition apparatus having a shower plate, disclosed in document 1.

Claim 11

The invention set forth in claim 11 does not involve an inventive step in the light of document 1 and documents 4 and 5 cited in the international search report. Document 1 does not disclose technical means whereby, "when specified atoms in an oxide thin film being manufactured are easily diffused in a substrate, epitaxial growth is achieved by increasing the amount of said atoms in an initial layer to an amount greater than

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Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

would be used with a substrate in which said atoms do not easily diffuse." However, documents 4 and 5 disclose a feature wherein, because the Pb in a PZT thin film is easily diffused in Pt, the amount of Pb discharged is increased during formation of initial nuclei. The inventions disclosed in document 1 and documents 4 and 5 belong to closely related technical fields. Therefore, a person skilled in the art could easily conceive of applying the feature whereby, "when specified atoms in an oxide thin film being manufactured are easily diffused in a substrate, epitaxial growth is achieved by increasing the amount of said atoms in an initial layer to an amount greater than would be used with a substrate in which said atoms do not easily diffuse," disclosed in documents 4 and 5, to the oxide thin film formation method disclosed in document 1.

Claims 2 and 3

The invention set forth in claims 2 and 3 involves an inventive step relative to the documents cited in the international search report. Documents 1 to 5 do not disclose a feature wherein "first, an initial layer is formed as a seed layer using said mixed gas, and then a second layer is continuously formed using a mixed gas having a higher proportion of oxidizing gas than during formation of said initial layer."

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**Box No. VI      Certain documents cited**

**1.    Certain published documents (Rule 43bis.1 and 70.10)**

Application No. Patent No.	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
<b>JP 2003-324101 A</b>	<b>14.11.2003</b>	<b>30.04.2002</b>	

**2.    Non-written disclosures (Rule 43bis.1 and 70.9)**

Kind of non-written disclosure	Date of non-written disclosure (day/month/year)	Date of written disclosure referring to non-written disclosure (day/month/year)